

CHAPTER 3

THEORETICAL FRAMEWORK

BEHAVIORAL ECOLOGY

Human behavioral ecological theory has been discussed among anthropologists and archaeologists for over a quarter of a century and in that time the model has been both narrowed and broadened in scope. It has been applied to concepts of hunter-gatherer foraging, land use, resource use decisions, and has successfully incorporated evolutionary and neo-Darwinian theory with the goal of explaining the adaptations of behaviors in an ecological framework. The concept behind this widely applied theory in archaeology has advanced explanations of artifact designs and how these are reflected in social theory (Schiffer 1999; Winterhalder and Smith 2000; Bird and O'Connell 2006).

With a goal of documenting material culture, I present a behavioral ecology theoretic model with the intent to link the material culture data from Lost Valley to pre-historic human behaviors, with the aid of recorded ethnographic information. Human behavioral ecology theoretical concepts that apply directly to this work include the following issues: resource selection decisions and the production of surplus for trade; foraging practices; land use and migration; resource processing as a value-added trade commodity; environmental factors and their relation to the production and trade of value-added processed resources; and resource quality and availability, and their influences on artifact form and function.

The environment of Lost Valley provides a resource base that would provide staple carbohydrates, a dependable source of fresh spring water, which in turn supports a dense vegetation luring a host of faunal species that would provide ample sources of meat protein.

EVOLUTIONARY CONCEPTS

Darwinian theory applies here metaphorically in reproductive success as it pertains to the group, not the individual, as Charles Darwin had literally envisioned. Social Darwinism or neo-Darwinism is in synch with behavioral ecology theory and may have been engulfed within it under a "processual-plus" rubric (Hegmon 2003). Darwinist selection and

adaptation paradigms have infiltrated and morphed into various, newer postulates, including behavioral ecology (Winterhalder and Smith 2000), agency theory (Cowgill 2000), and game theory (Davenport 1960; Pollock 1994; Dugatkin 1995).

These theories unite around a rubric of decision-making. Whether it is the individual, the family, or the entire group, decisions are made constantly and often unconsciously. Many unconscious decisions are made based on past outcomes and expected results. However, conscious decisions are made with certain level of reflection. Prehistoric peoples were totally dependant on the natural environment. A positivist view is based on the idea that human behavioral science should model itself on the natural sciences, of which they are a part (Johnson 1999:138). As environmental and socio/political situations change, so must the group adapt to meet these changes. Those decisions could make the difference between boom or bust. When survival is wholly dependant on the environment, eking out an existence in southern California, with its typical long and short cyclical climate patterns, reinforces the need to adapt.

An evolutionary point of view is contingent upon the assumption that the initial “discovery or invention” of a particular tool, trait, or practice is irrelevant. What matters is why and how this particular phenomenon became fixed in the culture and then appeared in the archaeological record (Dunnell 1996).

Group survival and reproductive success is ensured as long as ample resources are acquired and the potential for hostilities with neighbors is suppressed. Trade, in the form of tools, commodities, and especially mates, ensures this compatibility. This inter-group activity ensures a higher level of compatibility in the short term for trade of tools, foods, and finished implements, and in the long term when mates are exchanged, since sanguineous family ties logically would foster visitation, and therefore offer extended trade opportunities and continued relationships (Taussig 1995:388; Smith 1983).

In the particular environment of the southern California Peninsular Ranges, where there are less than adequate flaked stone lithic raw materials, white milky quartz is the most common material used for chipped stone tools. When considering the dearth of high quality flaked stone lithic raw materials available locally, it would be a logical choice for prehistoric peoples to use what is readily available, regardless of the quality.

Less energy was required to utilize this local resource because less energy would be spent traveling long distances to acquire higher quality lithic materials that were needed for everyday tasks, either in the form of finished formal tools or in transporting heavy, bulky raw materials. Traveling on foot over the distances necessary to acquire high quality lithic materials would have also required a certain level of risk as well as energy costs. Higher quality materials that are rare or that require long distance travel or trade would become a commodity for importation, taking advantage of the various affinal and sanguine links and trade relationships formed over time. Trade items with which to exchange could be in the form of resources available locally and those that are in abundance and hence could produce a surplus.

GAME THEORY

It has been demonstrated that social animals, even the lower classes of social animals, make relatively complex decisions and are capable of complex social behavior (Dugatin 1995). Humans make an uncountable number of decisions daily, many of which are mundane and made unconsciously. It involves the simple act of making decisions that maximize profit while minimizing costs (Barash 2003). Human groups make decisions as well for the benefit of the group as a whole for a myriad of profitable reasons. Game theory, as it was originally applied to anthropological interpretations by William Davenport (1960), investigated the behavioral decision making actions of a population living in a Jamaican fishing village. Davenport's game theory application to this population identified the players of the "game" with one of the prime opponents being the environment.

The situation at Lost Valley for the Cupeño could be viewed under a similar lens, with like opponents. The game strategy that the Cupeño of Lost Valley would have played in this philosophical exercise would include as "players", their neighboring cultures, other Cupeño villages, and the natural environment. To "win" the game, the subject group would advance in any manner of applications, most of which would be centering on the survival theme. As long as the group survives, the game endures. People make decisions on a number of issues on a regular basis, such as trade, what resources to collect, whether to apply value-added labor in the processing of resources, with whom to trade the processed goods, and what to acquire in return. Trade items may include food resources, tools and raw materials,

mates, items of body adornment, religious or spiritual value, and even knowledge. Normally, simple consumable items are but a one-time deal, but trade items of the utmost strategic value would be items such as mates that endure through horizontal family ties and vertical, branching family trees. Family ties have a way of cementing relationships to further advance trade actions that leave physical traces in the archaeological record (Dugatkin 1995). By comparing unique stylistic artifacts, these links can be inferred.

As in all disciplines of science, multiple lines of evidence are an obligatory component of any thesis or analysis. The use of game theory in archaeological, linguistic, and ethnographic contexts would appear to be requisite as a comparative tool. In this context, I assert that game theory, along with Darwinian concepts, are both a supportive paradigm to, and a component within, the human behavioral ecology theory.